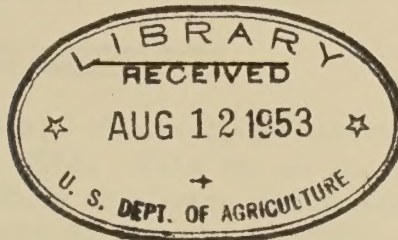


MINNESOTA 97 ROSEAU

FIELD APPRAISAL ANALYSIS

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Prepared by  
Field Appraisal Section  
Program Analysis Division  
RURAL ELECTRIFICATION ADMINISTRATION



Field Appraisal  
Completed in  
May 1953

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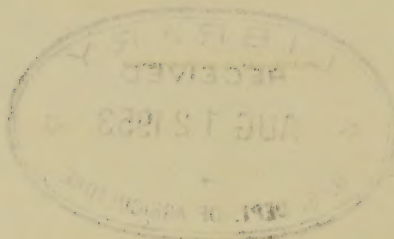
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WILSON, J. A.

WILSON, J. A.

Received by  
Field Agent  
J. A. Wilson  
August 12, 1953  
Bureau of Entomology and Plant Quarantine



Field Agent  
J. A. Wilson  
Aug 12, 1953

Received  
J. A. Wilson  
Aug 12, 1953



June 22, 1953

Field Appraisal Section  
Program Analysis DivisionSUMMARY AND CONCLUSION  
MINNESOTA 97 ROSEAUAREA CHARACTERISTICS

The total population of Roseau County increased by 15 percent during the period 1930-1950, but from 1940-1950 it decreased by 4 percent. Farm population, which constituted approximately 60 percent of the total population of the area in 1950, has decreased by 4 percent during the past two decades. The major source of income in this area is from agriculture, of which 38 percent is from livestock and livestock products, and practically all of the remainder from field crops. The pulpwood and lumber industry provides a source of farm income as well as off-farm work for area residents. The average value of land and buildings was \$7,881 in 1950, which was 40 percent higher than 5 years earlier. Gross income from the sale of farm products averaged \$3,117 in 1949. One-third of the farmers worked off the farm in 1949, but only 11 percent worked 100 days or more off the farm. The area residents are of a conservative pioneer variety. The terrain ranges from level to nearly level to undulating. Surface drainage is generally poor, owing to the flatness of the terrain.

ULTIMATE NUMBER OF CONSUMERS

On March 31, 1953, this cooperative was serving a total of 2,359 consumers. The manager has estimated that a total of 3,475 consumers will be served by 1963. From a careful consideration of related facts pertaining to the area, an estimate of 3,200 ultimate consumers appears to be reasonable.

ESTIMATED FUTURE CONSUMPTION OF ELECTRICITY

This system was energized in 1944. Since 1945, average monthly farm consumption rose from 55 kwh to 125 kwh in 1952. This is an increase of 10 kwh in average monthly usage for each year. Farm consumers indicated that they expected to increase their use of electricity 52 percent by 1956. Town residential consumers indicated an increase of 79 percent during the same period.

Increasing costs of purchased power, active competition with LP gas, and the supply of wood for use as fuel are serious deterrents to future use of electricity in this area. Power costs have risen steadily from 15.0 mills to 23.7 mills per kwh during the period 1945-1952. The survey revealed that by 1956 nearly 47 percent of the consumers in the area will be using LP gas for one or more purposes.

Based on all factors believed to be significant, this analysis leads to the following estimates, which are certified as being reasonable and may be expected to be attained in the years indicated:



2-Summary - Minnesota 97 Roseau - June 22, 1953

Class of Consumer	12 Months Ended			
	December 31, 1952	1955	1958	1963
Farm	125	155	185	220
Nonfarm and Town Residential	74	90	110	130
Small Commercial	123	175	205	250
Public Buildings	63	80	95	110
Large Commercial (annual)*				
Rollis Cooperative Creamery		13,000	14,000	15,000
Ross Creamery		24,000	24,500	25,000
Grygla Cooperative Creamery		51,000	51,500	52,000
Wannaska Creamery		60,000	62,000	65,000

\*Shown on operating report as small commercial.

Richard G. Schmitt, Jr., Head  
Field Appraisal Section  
Program Analysis Division



June 22, 1953

Field Appraisal Section  
Program Analysis Division

ANALYSIS OF BASIC FACTORS RELATED TO  
THE RURAL ELECTRIFICATION LOAN FOR  
MINNESOTA 97 ROSEAU  
(REAPPRAISAL)

This analysis of the probable future consumption of electricity for the Roseau Electric Cooperative, Incorporated, with headquarters at Roseau, Minnesota (Figure 1), is based on a field study conducted by Arthur S. Hiatt, Agricultural Economist, Field Appraisal Section, Program Analysis Division, and was completed in May 1953. This analysis was prepared by William B. Kingree, Agricultural Economist, Field Appraisal Section, Program Analysis Division.

The original appraisal of this system was made in 1947.<sup>1/</sup> The sample units used in the 1947 study were resampled at this time. The field work consisted primarily of visits to 220 served and prospective consumer units. Of these, 163 were served farm consumers, 37 were served town residential consumers, 4 were served large commercials, and 16 were unserved farm and nonfarm units.<sup>2/</sup> Of the 16 unserved units, 7 indicated intentions of taking electric service within the next 3 years, while the remaining 9 were not interested in electric service. In addition, local bankers and agricultural leaders were consulted as to local economic trends and their estimates of the future for the area with respect to the use of electric power.

ULTIMATE NUMBER OF CONSUMERS

On March 31, 1953, this cooperative was serving a total of 2,359 consumers. The manager has estimated that a total of 3,475 consumers will be served in 1963 (Figure 2). This is an increase of 47 percent over those presently receiving service. Presumably, the ultimate number includes those consumer units anticipated due to increased habitation in the area as well as those presently served who are expected to remain.

Table VIII shows that the population of Roseau County has fluctuated upward during the past 30 years, but during the past 10 years it has declined by 4 percent. At the same time, the number of farms has been increasing at a decreasing rate. The average size of farm has been increasing, which indicates consolidation of small units into larger, more efficient units. According to the appraiser, approximately 15 percent of the farms in the survey were either abandoned or vacant. The original appraisal indicated that there were in the system area in 1947 the following: 2,736 farms, 136 nonfarm residential, and 146 commercial accounts. On

<sup>1/</sup> See appraisal analysis for subject system dated September 10, 1948.

<sup>2/</sup> Respondents in the survey were randomly selected and comprise a geographic block sample of approximately 8 percent of the farm consumer units within the optimum boundary of the system.



March 31, 1953, the cooperative billed 2,052 farm, 128 town residential, and 164 commercial consumers. A consideration of these facts in conjunction with the manager's estimates tends to support an estimate of 3,200 as ultimate, or the number that might reasonably be expected in 10 years. This figure is based on a reduction of the manager's estimates as follows: farms, 5 percent; town residential, 10 percent; commercial, 25 percent; and new farms, 25 percent.

NATURE OF PRESENT AND INDICATED FUTURE CONSUMPTION  
OF ELECTRICITY AS REVEALED BY THE SURVEY

A tabulation of the raw data secured from the respondents revealed the following average monthly consumption figures:

TABLE I

INDICATED MONTHLY KWH CONSUMPTION<sup>a/</sup>

Consumer Class	Present	Future <sup>b/</sup>	Percent Increase
Farm	174	265	52
Town Residential	103	184	79

<sup>a/</sup> Based on indications by respondents in the survey and average energy requirements as determined by REA on a country-wide basis. Farm consumers were using electricity at 76 percent of the average rate established by REA on a country-wide basis. Town residential consumers were using 68 percent of the average.

<sup>b/</sup> Based on what respondents expect to add in 3 years.

Historical consumption records for farm and nonfarm consumers in the survey indicate a rising average consumption. Generally, farm consumers added in recent years appear to have attained higher initial averages than those connected over a longer period, while at the same time the increment of nonfarm consumers have attained lower initial averages than those connected during the first years of the system's existence. This is revealed in Tables II and III. It is evident from Tables I, II, and III that consumers are not using the average kwh per appliance as determined by REA for the country at large.



TABLE IIAVERAGE MONTHLY KWH CONSUMPTION  
OF 163 FARM CONSUMERS

<u>Total Number Years With Electricity</u>	<u>Number of Schedules</u>	<u>Average Kwh Consumption Per Month</u>							
		<u>1945</u>	<u>1946</u>	<u>1947</u>	<u>1948</u>	<u>1949</u>	<u>1950</u>	<u>1951</u>	<u>1952</u>
8	15	61	83	93	123	146	170	200	215
7	4	---	48	62	93	95	100	104	120
6	2	---	---	46	72	78	71	69	83
5	33	---	---	---	105	128	150	153	176
4	66	---	---	---	---	75	90	103	118
3	25	---	---	---	---	---	52	78	95
2	11	---	---	---	---	---	---	96	106
1	7	---	---	---	---	---	---	---	64
Weighted Average		61	76	83	108	99	105	118	132

TABLE IIIAVERAGE MONTHLY KWH CONSUMPTION  
OF 35 NONFARM CONSUMERS

<u>Total Number Years With Electricity</u>	<u>Number of Schedules</u>	<u>Average Kwh Consumption Per Month</u>							
		<u>1945</u>	<u>1946</u>	<u>1947</u>	<u>1948</u>	<u>1949</u>	<u>1950</u>	<u>1951</u>	<u>1952</u>
8	1	40	54	56	59	48	53	55	53
7	3	---	57	77	96	127	125	146	135
6	2	---	---	41	46	48	53	90	104
5	12	---	---	---	39	52	79	94	99
4	1	---	---	---	---	36	56	48	37
3	9	---	---	---	---	---	49	51	46
2	4	---	---	---	---	---	---	25	25
1	3	---	---	---	---	---	---	---	18
Weighted Average		40	56	62	50	62	71	75	70

A saturation of electrical appliances and equipment measured in terms of the percent of consumers presently having them and a corresponding percent anticipated in the future was compiled from field schedules of presently connected consumers. The difference in saturation, as revealed by the increase in percentage points, was converted to future kwh requirements per 100 consumers for each appliance and piece of equipment. This tabulation is shown in Table IV.

APPLIANCE	PERCENT PRESENTLY HAVING	PERCENT ANTICIPATED	1954	1955	1956	1957	1958	1959	1960	1961	1962	1963
Refrigerator	100	100	100	100	100	100	100	100	100	100	100	100
Stove	100	100	100	100	100	100	100	100	100	100	100	100
Washing Machine	100	100	100	100	100	100	100	100	100	100	100	100
Radio	100	100	100	100	100	100	100	100	100	100	100	100
Television	100	100	100	100	100	100	100	100	100	100	100	100
Automobile	100	100	100	100	100	100	100	100	100	100	100	100
Tractor	100	100	100	100	100	100	100	100	100	100	100	100
Other	100	100	100	100	100	100	100	100	100	100	100	100

TABLE IV  
FUTURE KWH REQUIREMENTS PER 100 CONSUMERS

TABLE IV

APPLIANCE	PERCENT PRESENTLY HAVING	PERCENT ANTICIPATED	1954	1955	1956	1957	1958	1959	1960	1961	1962	1963
Refrigerator	100	100	100	100	100	100	100	100	100	100	100	100
Stove	100	100	100	100	100	100	100	100	100	100	100	100
Washing Machine	100	100	100	100	100	100	100	100	100	100	100	100
Radio	100	100	100	100	100	100	100	100	100	100	100	100
Television	100	100	100	100	100	100	100	100	100	100	100	100
Automobile	100	100	100	100	100	100	100	100	100	100	100	100
Tractor	100	100	100	100	100	100	100	100	100	100	100	100
Other	100	100	100	100	100	100	100	100	100	100	100	100

TABLE IV  
FUTURE KWH REQUIREMENTS PER 100 CONSUMERS

TABLE IV



TABLE IV

PRESENT AND INDICATED SATURATION OF ELECTRICAL APPLIANCES  
AND EQUIPMENT AND CORRESPONDING INDICATED INCREASE IN  
KWH USAGE OF FARM AND NONFARM CONSUMERS

APPLIANCE OR EQUIPMENT	FARM				NONFARM			
	PERCENT OF CONSUMERS A/	INCREASE B/	PERCENT OF CONSUMERS A/	INCREASE B/	PERCENT OF CONSUMERS A/	INCREASE B/	PERCENT OF CONSUMERS A/	INCREASE B/
	INDICATING : FUTURE USE	POINTS	INDICATING : FUTURE USE	POINTS	INDICATING : FUTURE USE	POINTS	INDICATING : FUTURE USE	POINTS
	USING	CONSUMERS	USING	CONSUMERS	USING	CONSUMERS	USING	CONSUMERS
AIR COMPRESSOR	13	5	2	70	—	—	—	—
ANIMAL CLIPPER	3	4	1	3	—	—	—	—
BATH	—	1	1	600	—	—	—	—
BATTERY CHARGER	7	8	1	12	—	—	—	—
BLANKET	1	1	—	—	—	—	—	—
BROILER	—	—	—	—	—	—	—	—
BROODER (HOVER)	7	10	3	480	3	3	—	—
BROODER (INFRARED)	1	1	—	—	—	—	—	—
CHURN	3	3	—	—	—	—	—	—
CLOCK	64	65	1	18	20	20	—	—
CLOTHES DRIER	3	5	2	1,400	—	—	—	—
COAL STOKER	—	—	—	—	3	3	—	—
CONCRETE MIXER	—	—	—	—	—	—	—	—
CREAM SEPARATOR	41	46	5	175	—	—	—	—
DISHWASHER	1	1	—	—	—	—	—	—
DRILL PRESS	21	26	5	60	—	—	—	—
ELEVATOR, GRAIN	9	9	—	—	12	12	—	—
FAN (CENT. HOT AIR)	7	7	—	—	5	5	—	—
FAN (EXHAUST)	1	1	—	—	—	—	—	—
FAN (HOUSEHOLD)	20	21	1	15	19	19	—	—
FAN (ATTIC VENTILATOR)	1	1	—	—	—	—	—	—
FAN, VENTILATOR (DAIRY BARN)	1	2	1	240	—	—	—	—
FAN, VENTILATOR (LIVESTOCK BARN)	—	1	1	200	—	—	—	—



2-Table IV - Minnesota 97 Roseau - June 22, 1953

APPLIANCE OR EQUIPMENT	FARM				NONFARM			
	PERCENT OF CONSUMERS A	INCREASE B	PERCENT OF CONSUMERS A	INCREASE B	PERCENT OF CONSUMERS A	INCREASE B	PERCENT OF CONSUMERS A	INCREASE B
	PRESENTLY USING	INDICATING FUTURE USE	PERCENTAGE POINTS	PERCENTAGE POINTS	PRESENTLY USING	INDICATING FUTURE USE	PERCENTAGE POINTS	PERCENTAGE POINTS
FEED GRINDER OR ROLLER	1							
FEED MIXER	1							
FENCE	11	13		100				
FOOD MIXER	40	42	2	50	38			
GARDEN WATERING	5	5	2					
GERMICIDAL LAMP								
HAND DRILL								
HEAD BOLT HEATER	24	25	1	15	19			
HEATING PAD	17	17			24			
HOME FREEZER	20	28	8	7,200	5			
HOT PLATE	36	37	1	70	21			2,700
IRON	92	92			92			210
KNIFE SHARPENER	1	1						
LAMB BROODER	1	2						
LATHE	1	1						
LIGHTING					3			
BEEF CATTLE BARN	1	1						
BUNK HOUSE	2	3		15				
CAVE OR SPRING HOUSE	21	21	1		5			
DAIRY BARN	4	6	2	70				
GARAGE	37	39	2	16	27		3	24
GENERAL BARN	78	82	4	96				
GRAIN AND FEED								
STORAGE BUILDING	34	37	3	6				
HOG BARN	2	2						
HOG HOUSE	100	100			100			
MILK HOUSE	16	17		35				
OTHER BUILDINGS	6	7		12	5			
POULTRY BROODER HOUSE	10	11		5	3			15
POULTRY LAYING HOUSE	29	33	4	140	3			
SHOP	16	21	5	60	5			
YARD	94	96	2	36				
LIVESTOCK WATERING	61	69	8	1,440				



3-Table IV - Minnesota 97 Roseau - June 22, 1953

APPLIANCE OR EQUIPMENT	FARM				NONFARM			
	PERCENT OF CONSUMERS		INCREASE B/		PERCENT OF CONSUMERS		INCREASE B/	
	A/		:		A/		:	
	USING	FUTURE USE	POINTS	CONSUMERS	USING	FUTURE USE	POINTS	CONSUMERS
MANGLE (IRONER)	1	2	1	20	—	—	—	—
MILK COOLER	1	3	2	2,874	—	—	—	—
MILKING MACHINE	19	29	10	3,280	—	—	—	—
OIL FURNACE	7	8	1	300	3	8	—	—
PERCOLATOR	10	10	—	—	—	—	—	—
PIG BROODER	1	1	—	—	—	—	—	—
POPCORN POPPER	1	1	—	—	—	—	—	—
POWER SAW	13	13	—	—	5	5	—	—
PRESSURE SYSTEM	15	23	8	1,440	5	8	3	540
(LESS THAN 22')								
PRESSURE SYSTEM	10	18	8	1,920	—	19	19	4,560
(GREATER THAN 22')								
PUMP (SUMP)	—	—	—	—	12	12	—	—
RADIO	97	98	1	100	100	100	—	—
RANGE	13	38	25	30,000	13	32	19	22,800
REFRIGERATOR	76	88	12	4,320	75	79	3	1,080
ROASTER	3	3	—	—	—	—	—	—
SEED CLEANER	21	23	2	6	—	—	—	—
SEWING MACHINE	16	18	2	20	19	19	—	—
SOLDERING IRON	22	23	1	15	5	5	—	—
SPACE HEATER, PORTABLE	7	7	—	—	5	5	—	—
STOCK TANK, HEATER	1	1	—	—	—	—	—	—
TELEVISION	—	4	4	1,440	—	8	8	2,880
TOASTER	63	67	4	140	62	62	—	—
TOOL GRINDER	26	28	2	50	14	14	—	—
VACUUM CLEANER	32	34	2	40	27	35	8	160
WAFFLE IRON	43	45	2	50	35	38	3	75
WASHING MACHINE	93	95	2	70	81	81	—	—
WATER HEATER (POUR-IN)	1	1	—	—	—	—	—	—
WATER HEATER (PRESSURE TYPE)	1	2	1	2,000	—	—	—	—
WATER HEATER WITH BATH	10	26	16	48,000	3	22	19	57,000
WATER HEATER WITHOUT BATH	1	1	—	—	—	—	—	—
WATER PAIL	8	9	1	300	3	3	—	—
WATER WARMER	2	2	—	—	—	—	—	—
WELDER	23	34	11	825	3	5	2	150
WOOD SAW	1	1	—	—	—	—	—	—

A/ BASED ON INDICATIONS OF PRESENTLY CONNECTED CONSUMERS.

B/ BASED ON AVERAGE ENERGY REQUIREMENTS DETERMINED BY REA. DATA DO NOT REFLECT INSTANCES WHERE MORE THAN ONE OF THE SAME APPLIANCE EXIST PER CONSUMER. THESE CASES ARE RARE AND DO NOT AFFECT THE OVER-ALL PATTERN MATERIALLY.



### ECONOMIC CHARACTERISTICS

The following, based on 1950 Census data for Roseau County, supplements the presentation of economic characteristics in the original appraisal.

During the period 1930-1950, the total population of Roseau County increased by 15 percent. Farm population during this period decreased by 4 percent, while nonfarm population increased by 65 percent. In 1950, the farm population constituted 61 percent of the total population.

Farming is diversified in Roseau County. The sale of cash crops (small grains) in 1949 accounted for about 62 percent of the gross farm income in the county. Average yields per acre for these crops were: wheat, 16 bushels; oats, 30 bushels; barley, 23 bushels; rye, 14 bushels; and flaxseed, 8 bushels. These averages are comparable to those for the State. The sale of livestock and livestock products in 1949 accounted for 38 percent of the gross farm income. Farms reporting livestock kept an average of 15 head of cattle and calves, of which 44 percent were classified as dairy cattle, 4 head of hogs, 37 head of sheep, and 73 chickens. The average cash income per farm from the sale of farm products in 1949 was \$3,117. Of the farms reporting sale of farm products in 1949, about one-half had cash farm incomes of \$2,500 or more.

From 1944-1949, there was a 5 percent increase in farm acreage, a 3 percent increase in the number of farms, a 2 percent increase in the average size of farms, and a 55 percent increase in the value of land and buildings.

Ninety-four percent of the farm operators in Roseau County in 1950 owned their farms in full or in part, while 89 percent of the operators resided on the farm. Thirty-three percent of the operators reported working off the farm in 1949, and 11 percent reported working 100 days or more off the farm. Fourteen percent reported other income of the family exceeding the value of farm products sold.

In 1950, 33 percent of the farms had one or more trucks, 83 percent had one or more tractors, and 78 percent had one or more automobiles.

Seventy-nine percent of the farms in Roseau County are located alongside a hard-surfaced or gravel road. An average distance of 8 miles to a trading center was reported, with 28 percent of the farms being less than 5 miles from such center.

According to banks visited in the area, the ratio of deposits to loans is 2.6 to 1.0. Bank officials estimated that farmers held 60 percent of the savings deposits, and that 70 percent of the bank's loans were to farmers. The supervisor of the local Farmers Home Administration Office reported a total of 65 farm ownership loans outstanding in Roseau County in 1952. These loans averaged \$4,502 each.



Minnesota 97 Roseau - June 22, 1953

According to the appraiser, it is evident that there has been substantial progress in the area during the past 5 years. Land-clearing operations have increased the size of farms and brought into existence new farms, the soil has been improved, and many of the farms are well equipped with modern machinery.

#### PHYSICAL CHARACTERISTICS

An adequate description of the physical characteristics of the area is presented in the original appraisal.

#### ANALYSIS OF FUTURE KWH CONSUMPTION

This system was energized in 1944. Since 1945, average monthly farm consumption has increased from 55 kwh to 125 kwh in 1952. This is an increase of 10 kwh in average monthly usage for each year. Table II shows that new consumers are generally being added at levels of consumption of approximately 1.4 times that of the initial consumption of the earlier consumers.

If consumption is to increase at the rate indicated in Table I, we might expect an average monthly farm figure of 190 kwh ( $125 \times 1.52$ ). The average monthly nonfarm figure would be 132 kwh ( $74 \times 1.79$ ). To achieve these increases, the specific additional kwh resulting from indicated future saturation of appliances and equipment as shown in Table IV must be attained.

Approximately seven-eighths of the indicated increase would need to occur in the household. Furthermore, three-fourths of the indicated increase would need to occur as a result of the addition of ranges, home freezers, and water heaters.

There are other factors which must be considered in arriving at estimates of future electric consumption. Among these are (1) the extent to which LP gas use is likely to reduce the indicated future increases in electrical usage, (2) a consideration of the attainment of selected past indications (1947 appraisal) regarding use of electricity as revealed by the survey, and (3) the extent to which other related economic trends are likely to have their impact upon the indicated future consumption.



TABLE V

INDICATED AND ESTIMATED KWH USAGE, FARM CONSUMERS  
BY CHARACTER OF LOAD PER 100 CONSUMERS<sup>a/</sup>

Use	: :Saturation	: :Increase	:Percent of: :Indicated:Indicated :Increase	: :Estimated:Estimated:Increase	: :Present:Use	:Estimated :Future :Total
<u>Major Household Uses</u>						
Water Heater	27	36,480	44.1	18,240	23,438	41,678
Range	38	22,344	27.0	11,172	12,312	23,484
Home Freezer	28	5,472	6.6	4,378	13,817	18,195
Refrigerator	88	3,338	4.1	3,171	20,821	23,992
Pressure System (less than 22')	23	1,176	1.4	1,058	2,011	3,069
Television Receiver	4	1,176	1.4	882	---	882
Clothes Drier	5	958	1.2	287	1,649	1,936
<u>Major Productive Uses</u>	---	10,685	12.9	5,343	28,819	34,162
<u>All Other Uses</u>	---	1,067	1.3	534	55,906	56,440
<b>Total</b>		<b>82,696</b>	<b>100.0</b>			

Estimated annual average increase (total) in kwh consumption  
per 100 consumers - 1956 45,065 203,838

Estimated annual average increase (total) in kwh consumption  
per consumer - 1956 451 2,038

Estimated monthly average increase (total) over a 3-year  
period - 1953-1956 38 170

<sup>a/</sup> Adjusted. Appliance usage and amount of electricity is 76 percent of the average for the United States as determined by REA.

Table VI indicates that about 43 percent of the consumers are presently using LP gas for one or more purposes. An additional 4 percent not now using gas have indicated their intent to do so in the future. Of 182 respondents in the 1947 appraisal, about 8 percent were using gas for cooking and 2 percent for water heaters. There were no indications from the remaining 92 percent of the respondents in the 1947 appraisal that they planned future use of gas. Approximately one-half of the total future indicated load will be in active competition with LP gas.



TABLE VI

STATUS OF LP GAS USE, 199 RESPONDENTS  
REPORTING IN RANDOM SAMPLE SURVEY<sup>a/</sup>

Consumers' Position With Respect to Use of Gas	Number in Survey	Percent of Total
Not using and not planning to use	106	53.3
Not using but planning to use	8	4.0
Presently using LP gas	85	42.7
Used for:		
Cooking	83	
Water Heating	8	
House Heating	6	
Refrigeration	2	
Chick Brooder	1	
Total		100.0

<sup>a/</sup> All served farm and town residential respondents indicating use of gas.

A comparison of the saturation of appliances and equipment presented in Table VII shows that respondents practically fulfilled their intentions to use irons, radios, refrigerators, and home freezers, while they only partially fulfilled their intentions to use milking machines, ranges, and water heaters. During the period 1947 through 1952, the number of farm consumers increased by 299 percent. This rapid growth is probably the reason why respondents have not fulfilled their intentions. This is true for example in the case of those using electricity for pressure systems and livestock watering since consumers added recently have not had time to acquire this equipment.



TABLE VII

ATTAINMENT OF PAST INDICATIONS AND INDICATIONS OF  
FUTURE USE OF ELECTRICAL APPLIANCES AND EQUIPMENT

Item	Saturation			
	1947		1953	
	Using	Indicating Future Use	Using	Indicating Future Use
Iron	95	100	92	92
Radio	93	100	97	98
Livestock Watering	72	95	61	69
Refrigerator	23	79	76	88
Pressure System (greater than 22')	19	47	10	18
Milking Machine	16	26	19	29
Range	9	21	13	38
Water Heater (with bath)	--	21	10	26
Home Freezer	9	21	20	28
Pressure System (less than 22')	--	5	15	23

a/ Served farms only. Based on 47 schedules for 1947 and 163 schedules for 1953.

The retail rate schedule in effect at the time of the appraisal is as follows:

FARM AND HOME SERVICE

First 40 kwh per month @\$0.12 per kwh  
 Next 60 kwh per month @ 0.06 per kwh  
 All over 100 kwh per month @ 0.03 per kwh  
 Minimum charge \$4.80 per month

FARM AND HOME SERVICE WITH STORAGE-TYPE WATER HEATER

With or Without Electric Range

First 40 kwh per month @\$0.12 per kwh  
 Next 60 kwh per month @ 0.06 per kwh  
 Next 300 kwh per month @ 0.015 per kwh  
 All over 500 kwh per month @ 0.03 per kwh

Service in rural villages--\$2.00 per month (minimum)



From Table VIII, trends in the area relative to the State indicate the service area to be generally lowering in importance in spite of its absolute increase. Population has fluctuated at a lower level compared with the State. This is further reflected in the less favorable relation of farm incomes and values of land and buildings reported in 1949, as compared with earlier periods. Power costs have risen, both absolutely and relatively, since 1945. The number of farms and the percent of farms engaged in dairying have shown a very slight increase, however, while average consumption has increased somewhat more rapidly.

Considering the heavy present use and probable continued use of LP gas in the service area, the supply of wood for use as fuel, the attainment of past indications (1947 appraisal) regarding use of electricity, the observation that field appraisals in this region have shown that it is not unlikely that it may require as many as 15 years to achieve the indicated increases that the area characteristics show no secular advantage over similar State characteristics, and the high cost of purchased power, the attainment of the indicated consumption within a 3-year period appears to be unlikely at this time. On the basis of these and related factors, it is estimated that within 3 years 50 percent of the indicated increase for water heaters and ranges will be realized. About 80 percent of the increase attributed to home freezers, 95 percent to refrigerators, 90 percent to pressure systems, 75 percent to television receivers, and 30 percent to clothes driers are also expected to be realized. It is also estimated that 50 percent of the increase imputed to productive and other uses will be realized. Kilowatt-hour increases at these rates are shown in Table V.

The appraiser was of the opinion that consumers had not used more electricity for one or more of the following reasons: (1) relatively high retail rates which discourage greater use of electricity by those who are forced to find the most economical method of performing jobs on the farm, even if it must be done manually; (2) effective competition from LP gas dealers with respect to ranges and water heating; and (3) some consumers who could afford appliances and equipment have not made these purchases because of conservativeness, while young people who are just starting out would utilize more electricity if they could afford to purchase appliances and equipment. Very little hope is entertained by the manager and other officials of the cooperative of reducing retail rates as long as high wholesale power costs prevail. According to the appraiser, the water heater rate now in effect, however, has offset the advantage LP gas dealers had at one time. Dilution of consumers has caused a lower average consumption than would otherwise be reflected on the operating report. Furthermore, expected increases in numbers of consumers during the next 10 years is likely to have a depressing effect on average kwh consumption.



TABLE VIII

TRENDS RELATED TO THE RATE OF  
INCREASE IN USE OF ELECTRIC POWER

<u>Item and Relationship</u>		<u>Trend</u>						
<u>Population</u>		<u>1920</u>	<u>1930</u>	<u>1940</u>	<u>1950</u>			
Roseau County		13,305	12,621	15,103	14,505			
State of Minnesota		2,387,125	2,563,953	2,792,300	2,982,483			
Ratio Area to State		.0056	.0049	.0054	.0049			
<u>Number of Farms</u>		<u>1910</u>	<u>1920</u>	<u>1925</u>	<u>1930</u>	<u>1935</u>	<u>1940</u>	<u>1945</u>
Roseau County		1,602	1,854	2,045	1,922	2,287	2,433	2,272
State of Minnesota		156,137	178,478	188,231	185,255	203,302	197,351	188,952
Ratio Area to State		.010	.010	.011	.010	.011	.012	.012
<u>Average Income From All Farm Products Sold</u>					<u>1939</u>	<u>1944</u>	<u>1949</u>	
Roseau County					\$1,399	\$2,258	\$3,117	
State of Minnesota					\$1,525	\$3,370	\$5,363	
Ratio Area to State					.92	.67	.58	
<u>Average Value of Land and Buildings</u>					<u>1939</u>	<u>1944</u>	<u>1949</u>	
Roseau County					\$4,033	\$5,078	\$ 7,881	
State of Minnesota					\$7,312	\$9,705	\$15,749	
Ratio Area to State					.55	.52	.50	
<u>Percent Dairy Farms</u>							<u>1944</u>	<u>1949</u>
Roseau County							10	14
State of Minnesota							21	28
Ratio Area to State							.48	.50
<u>Cost of Purchased Power</u>		<u>1945</u>	<u>1947</u>	<u>1949</u>	<u>1950</u>	<u>1951</u>	<u>1952</u>	
Minnesota 97 Roseau		1.50¢	1.65¢	2.42¢	2.24¢	2.28¢	2.37¢	
All Co-ops in Minnesota		1.20¢	1.28¢	1.45¢	1.44¢	1.42¢	1.39¢	
Ratio of Minn. 97 to All		1.25	1.29	1.67	1.56	1.61	1.71	
<u>Average Monthly Kwh Con- sumption Per Farm Consumer</u>		<u>1945</u>	<u>1947</u>	<u>1949</u>	<u>1950</u>	<u>1951</u>	<u>1952</u>	
Minnesota 97 Roseau		54	96	102	105	115	121	
4 Neighboring Co-ops		113	180	151	148	168	191	
Ratio Minn. 97 to Neighbors		.48	.53	.68	.71	.68	.63	



Minnesota 97 Roseau - June 22, 1953

COMMERCIAL CONSUMPTION

Following are listed a group of large commercial consumers, the estimated kw demand, and average monthly consumption:

<u>Name</u>	<u>Kw Demand</u>	<u>Average Monthly Kwh Consumption, 12 Months Ended December 31, 1952</u>
Rollis Cooperative Creamery	12	947
Ross Creamery	16	1,950
Grygla Cooperative Creamery	20	4,246
Wannaska Creamery	30	4,351

These consumers are shown on the operating report as small commercial.

In view of the data available and the foregoing analysis, it is certified that the following estimates are reasonable and may be expected to be attained by the years specified.

<u>Class of Consumer</u>	<u>12 Months Ended December 31, 1952</u>	<u>1955</u>	<u>1958</u>	<u>1963</u>
Farm	125	155	185	220
Nonfarm and Town Residential	74	90	110	130
Small Commercial	123	175	205	250
Public Buildings	63	80	95	110
Large Commercial (annual)*				
Rollis Cooperative Creamery		13,000	14,000	15,000
Ross Creamery		24,000	24,500	25,000
Grygla Cooperative Creamery		51,000	51,500	52,000
Wannaska Creamery		60,000	62,000	65,000

\*Shown on operating report as small commercial.

COOPERATIVE GROUPS

Although the listed group of 1944 commercial fishermen, the estimated 1944, and average monthly production.

Average monthly fish  
production, 1944  
Total production, 1944

1944  
1,350  
1,350  
1,350

12  
16  
20  
20

1944 Cooperative Group  
1944 Group  
1944 Cooperative Group  
1944 Group

These figures are shown as the operating report as small commercial.

In view of the data available and the foregoing analysis, it is estimated that the following estimates are reasonable and may be expected to be obtained by the small commercial.

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